AN2470
Application note

User guidelines for the low-voltage audio power amplifier demonstration board based on the TS4871

Introduction

This document describes the STEVAL-CCA038V1 which is the demonstration board based on the TS4871 low-power audio amplifier.

The micropackage DFN8 (dual flat no-lead 8-pin) is compact, saving board space and has good thermal dissipation.

The BTL gain is set at 2 V/V and can be adapted if necessary by modifying the R1 or R2 values.

On the board, the R3 and C3 component locations are empty to allow the designer to modify the input configuration from single-ended to differential mode. For differential mode, R4 must be modified.

The C1 component location is also empty in order to add a low-pass filter if required.

For more detailed information on calculating the component values, refer to the TS4871 datasheet.

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1 Features

- TS4871 low-voltage audio power amplifier with active-low standby mode
- Operating range from V_{CC} = 2.2 V to 5.5 V
- 1 W output power @ V_{CC} = 5 V, THD=1%, F=1 kHz, with 8 Ω load
- Ultra-low power consumption in standby mode (10 nA)
- 75 dB PSRR @ 217 Hz in grounded mode (Av = 2 V/V)
- Near zero “pop and click”
- Ultra-low distortion (0.1%)
- Module gain set at 2 V/V
- Thermal and short-circuit protection

2 Configuration of demonstration board connectors

Table 1. Demonstration board connectors

Connectors	Description
Cn1	Power connector (V_{CC} and GND). Power supply voltage from 2.2 V to 5.5 V
Cn2 and Cn3	Input signal connector (GND and active input signal).
Cn4	Output signal connector (V_{out1} and V_{out2})
Cn5	Standby control connector (GND, standby, V_{CC}). A short-circuit between GND and standby puts U1 in standby mode. A short-circuit between V_{CC} and standby puts U1 in operation mode.

Warning: When the power supply is applied through Cn1, DO NOT invert the polarity because it will destroy the amplifier U1.

3 Schematic diagram

Figure 1. Schematic diagram of the TS4871 (DFN8)

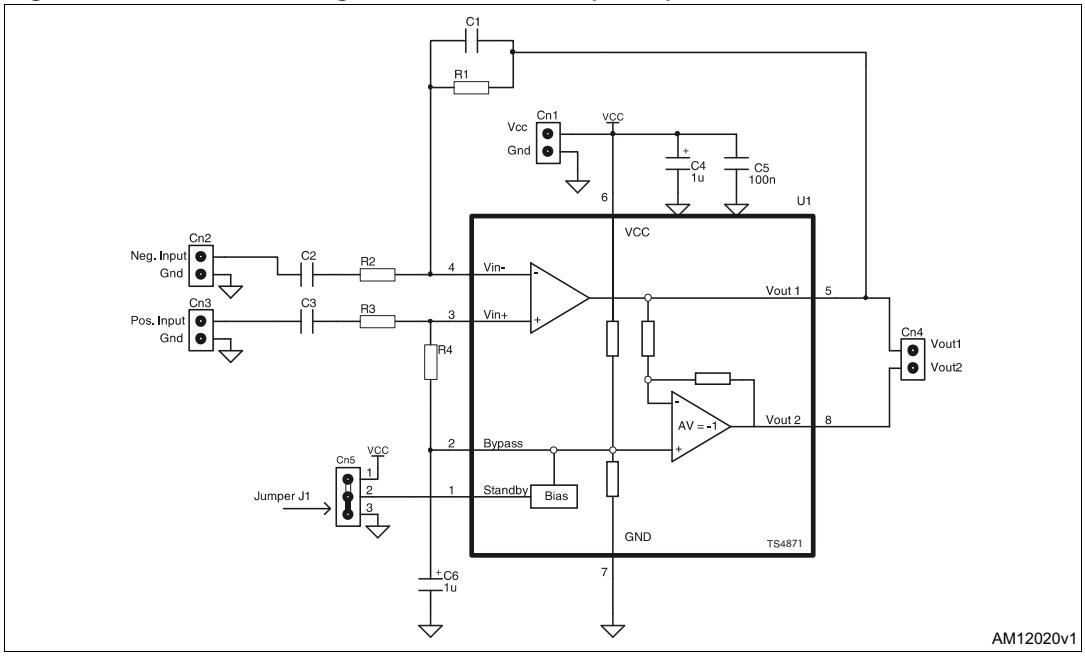

Table 2. Component list for the demonstration board TS4871 (DFN)

Designation	Quantity	Description
C1	0	Unconnected, ceramic capacitors, 0603
C2	1	100 nF/16 V, ceramic capacitors, 0603
C3	0	Unconnected, ceramic capacitors, 0603
C4	1	1 µF/50 V, electrolytic capacitor
C5	1	100 nF/16 V, ceramic capacitors, 0603
C6	1	1 µF/50 V, electrolytic capacitor
Cn1	1	2-pin header 2.54 mm pitch
Cn2	1	2-pin header 2.54 mm pitch
Cn3	1	2-pin header 2.54 mm pitch
Cn4	1	2-pin header 2.54 mm pitch
Cn5	1	3-pin header 2.54 mm pitch
J1	1	Jumper, 2.54 mm pitch
R1	1	22 k, 1/16 W 1% resistor, 0603
R2	1	22 k, 1/16 W 1% resistor, 0603
R3	0	Unconnected, 1/16 W 1% resistor, 0603

Table 2. Component list for the demonstration board TS4871 (DFN) (continued)

Designation	Quantity	Description
R4	1	0R, 1/16 W 1% resistor, 0603
U1	1	TS4871IQ (DFN8 package)

4 Demonstration board layout

The following figures show the layers and the top view of the TS4871 demonstration board.

Figure 2. PCB top layer

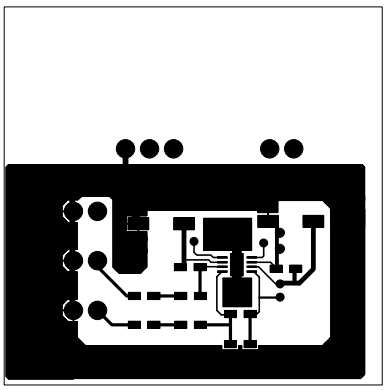

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Figure 3. PCB bottom layer

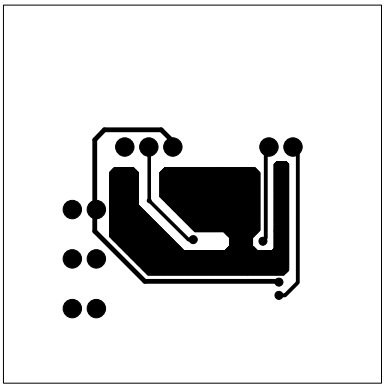

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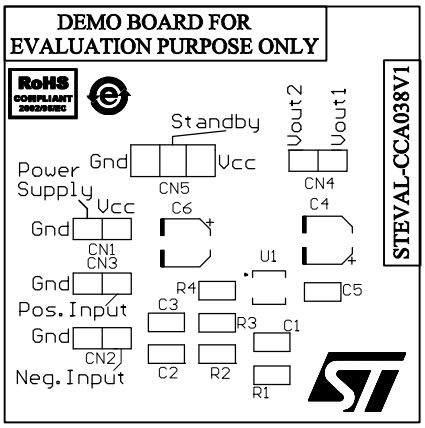
Figure 4. Top view of demonstration board



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5 Revision history

Table 3. Document revision history

Date	Revision	Changes
25-Jun-2009	1	Initial release
21-Mar-2012	2	– Changed: *Figure 2*, *3* and *4* – Minor text changes

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